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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,146	10/25/2006	Alexei Maznev	AMS-018	8648

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EXAMINER

LAPAGE, MICHAEL P

ART UNIT	PAPER NUMBER
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2886

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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/553,146	Applicant(s) MAZNEV, ALEXEI	
	Examiner MICHAEL LAPAGE	Art Unit 2886	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-13 are presented for examination.
2. As to new amended Claim 14, it appears to have not been submitted with the current set of amended claims and is therefore not being examined.

Claim Objections

3. Claim 1 is objected to because of the following informalities:
 - a. Claim 1, line 11, the examiner believes "and not on the ISTS component" should read --and no the ISTS component-- in order to further clarify the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 1, it is unclear to the examiner how the ISTS component is being referred to as a separate component from the refractive index component. When looking to applicant's specification (page 2, lines 11-24) it appears to the examiner that the ISTS contains multiple components one of which is the refractive index component. Therefore it is unclear to the examiner if there are two separate components or if the ISTS component does indeed encompass the refractive index component which the examiner believes to be correct based on

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applicants instant applications specification. Therefore the examiner is interpreting that the index of refraction is a function or response to the Impulse Stimulated Thermal Scattering (ISTS)

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-2, 6-9, 10-13 are rejected under 35 U.S.C. 103(a) as being obvious over Gostein et al in view of Fuchs et al (U.S. Patent No. 6,795,198 B1).

As to claim 1, Gostein discloses a method for measuring a film (22) comprising: irradiating the film (22) with a spatially periodic optical excitation field (3, 3') in order to generate a thermal grating (col. 2, lines 17-20; where the structure is a thin film i.e. as noted from title of invention)

generating a spatially periodic refractive index disturbance (i.e. thermal grating is a composition of changing thermal currents which inherently have periodic refractive indices) in a gas or liquid medium contacting the film (22) via heat transfer (25) from the film (22) to said medium (col. 1, lines 40-47; where as disclosed the local heating would inherently heat the air directly above the thin film);

diffracting a probe laser beam (6) off the refractive index disturbances in the said medium to form a signal beam (6') (col. 2, lines 20-21; where inherently the probe beam is propagating through the index of refraction disturbances caused by the local heating);

Gostein does disclose detecting the signal beam (6') as a function of time to generate a signal waveform (col. 2, lines 21-23); and determining at least one property of the film (22) based on the component of the signal waveform (col. 2, lines 23-25);

Gostein does not explicitly disclose where detecting the signal waveform having an ISTS component and determining at least one property of the film based on that component caused by the refractive index disturbances caused by the refractive index disturbances and not on the ISTS component.

However, Fuchs does disclose in (col. 1 line 63 thru col. 2 line 21; col. 3, lines 15-31) where a phase velocity dependent upon the change in refractive index is used in order to measure at least one property of a film (i.e. thickness).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gostein with by using additionally the refractive index in order to determine a property of a film to provide the advantage of a more

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versatile device capable of using another component of the detected beam in order to determine a property of a film.

As to claim 2, Gostein discloses a method wherein the film (22) comprises a metal film (col. 3, lines 7-11).

As to claim 6, Gostein discloses a method, where the medium in contact with the film is air (col. 2, lines 64-65; where implicitly the medium above the substrate that contains the thermal grating is air).

As to claim 7, Gostein discloses a method, wherein the refractive index disturbance (i.e. the thermal grating contains the disturbance being a variation in refractive index) in the medium is associated with the acoustic wave (col. 2, lines 64-65).

As to claim 8, Gostein discloses a method where the acoustic wave in the medium causes low frequency modulation (200) of the signal waveform (col. 2, lines 64-65; where inherently the low frequency oscillations are a result from the acoustic waves in air).

As to claim 9, Gostein discloses a method where the determining step is based on the analysis of the said low-frequency modulation (200) of the signal waveform (col. 2, line 65 thru col. 3, line 2).

As to claim 10, Gostein discloses a method, where the determining step comprises analysis of the signal waveform with an empirical calibration (col. 2, lines 52-54).

As to claim 11, a method, where the determining step comprises analysis of the signal waveform with a theoretical model comprising calculation of optical absorption by the film (22) (col. 1, lines 40-47);

analysis of thermal diffusion (i.e. local heating) (25) causing temperature increase in the gas (i.e. air) or liquid medium in contact with the film (22) (col. 1, lines 44-47);

analysis of the acoustic wave excitation caused by the temperature increase (col. 1, lines 48-52);

analysis of the probe beam (6') diffraction off the refractive index disturbance (i.e. thermal grating) caused by the temperature increase (25) and acoustic waves (27) in the medium (col. 1, lines 40-52).

As to claim 12, Gostein discloses a method, where the at least one property comprises a thickness of the film (22) (col. 3, lines 13-15).

As to claim 13, Gostein discloses a method, where the at least one property comprises a presence of the film (22) (col. 3, lines 15-17; where inherently if one is measuring thickness of a film a film is required to be present).

9. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being obvious over Gostein in view of Nelson (U.S. Patent No. 5,812,261 and Nelson hereinafter).

The applied reference has a common assignee in the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the

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reference was derived from the inventor of this application and is thus not an invention “by another”; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

As to claim 3, Gostein in view of Fuchs does not explicitly disclose a method where the film (22) is a metal film with a thickness less than 100 angstroms.

However, Nelson does disclose in (col. 3, lines 48-51) where the film thickness can be measured within tens of angstroms.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gostein in view of Fuchs with a smaller thickness range to provide the advantage of a more adaptable device that can measure even smaller film thicknesses when needed.

As to claim 4, Gostein in view of Fuchs does not explicitly disclose a method wherein the film (22) is deposited on an underlayer that is transparent to the excitation radiation.

However, Nelson does disclose in (col. 2, lines 47-50) where the sample can be in either the outer or underlying layer and that it is obvious to one of ordinary skill in the art that an order for the sample to be measured light would have to pass through the outer layer to heat up the lower layer to form the thermal grating.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gostein in view of Fuchs with a transparent outer layer to provide the advantage of being able to form the desired thermal grating on the air medium above the sample.

As to claim 5, Gostein in view of Fuchs does not explicitly disclose a method, wherein the film (22) is deposited on the underlayer characterized by a smaller absorption coefficient at the excitation wavelength compared to the film material.

However, Nelson does disclose in (col. 2, lines 47-50) where the sample can be on the underlayer and it is obvious to one of ordinary skill in the art, that in order to transmit light to the sample being measured one would obviously not want all the light to be absorbed before reaching the sample.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gostein in view of Fuchs by providing a lower absorption coefficient in order to provide the advantage of being able to excite the sample that is intended to be analyzed with the most amount of light as possible.

Response to Arguments

10. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL LAPAGE whose telephone number is (571)270-3833. The examiner can normally be reached on Monday Through Friday 7:30AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur Chowdhury can be reached on 571-272-2287. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael LaPage/
Examiner, Art Unit 2886

**/Roy M. Punnoose/
Primary Examiner, Art Unit 2886**